PROJECT DESCRIPTION

FOR

Project No. GJKZ 07-0087A&B
INSTALL BASEWIDE EMCS, PART 3

FAIRCHILD AIR FORCE BASE, WASHINGTON

Date: 12 September 2008

Attachment 2 to Solicitation

1. GENERAL: The contractors shall provide Fairchild AFB with an Energy Management Control System (EMCS) upgrade. The EMCS system provided shall be a native BACnet system with graphical user interface, accessible via Internet Explorer. Currently the base has a mixture of Invensys and Alerton controls systems, but that in no way prevents other vendors from offering or being awarded this contract.

2. PROJECT DATA:

   a. GJKZ 07-0087A, Extend EMCS:

      Project Scope Description: For Buildings 1, 3, 2005, 2007, and 2071 provide new discharge air sensors as detailed on the attached spreadsheet, in locations shown on the attached drawings. Also, for Building 3 replace the CO status horns with indicator lights as detailed on the attached spreadsheet, in locations shown on the attached drawings.

      Buildings 1, 3, 610, 2005, 2007, 2050, 2071, 2075, and 2163 have existing natural gas meters. The contractor shall provide pulse meter head, connection to EMCS, and programming for remote meter reading for each meter. Remote reading capability as a minimum includes trending every 15 minutes as well as totalized readings. Metered consumption shall be automatically displayed on Internet Explorer, along with other EMCS data. Buildings 1, 3, 610, 2005, 2007, and 2071 have one Schlumberger 15M rotary gas meter each. Building 2075 has one Schlumberger 8C rotary gas meter. Building 2050 has one Romet/Roots 15.3 rotary gas meter without remote reading; the two other gas meters at Building 2050 that already have remote reading capability are not within the scope of this project. Building 2163 has one Romet/Roots 7TC rotary gas meter.

      The contractor shall furnish and install power kWh meters with BACnet interfaces for Buildings 2005 (1 meter), 2007 (1 meter), and 2163 (2 meters, 1 for each transformer on mezzanine) with remote reading. Remote reading capability as a minimum includes trending every 15 minutes as well as totalized readings. Metered consumption shall be automatically displayed on Internet Explorer, along with other EMCS data.

      The contractor shall furnish and install one pulse output water meter for Building 2163 with remote reading. The contractor shall furnish programming and remote meter reading for existing water meters and connections in Buildings 2005 and 2007. Remote reading capability as a minimum includes trending every 15 minutes as well as totalized readings. Metered consumption shall be automatically displayed on Internet Explorer, along with other EMCS data.

      Utility locations for various buildings are shown elsewhere in this package.

b. GJKZ 07-0087B, Repair Basewide EMCS:

Project Scope Description: Replace the existing EMCS system controllers with a native BACnet system in Buildings 1, 3, 610, 2005, 2007, 2071, and 2075. Check existing wiring and reuse if replacement is not needed. Check existing 0 – 10 VDC and 4 – 20 mA sensors and recommission over entire operating range so they read accurately at the EMCS office, if reusable. If not reusable, or if a sensor is of another type (1000 ohm sensors, for instance), replace, and commission so accurate readings over the entire operating range are displayed in the EMCS office. See points spreadsheet elsewhere in the project package for details. Also, as Building 3 is the Fire Department, which includes the shelter-in-place switch and alarm paging, some supporting equipment must be installed in Building 2451 to support Building 3. Details are on a spreadsheet tab titled "Building 2451".

3. DESCRIPTION OF WORK AND SERVICES:

a. Scope of the upgrade is described herein, including materials lists, points lists, sequences of operation, HVAC drawing plans and salient characteristics. It is the responsibility of the contractor to provide a fully functional EMCS upgrade conforming to the salient characteristics described herein. Contractors may substitute controllers with different combinations of inputs and outputs in each controller as long as the overall controller inputs and outputs are at least as many as described herein, the inputs and outputs are in the proper functional locations, and the result is a fully functional system. Any additional parts a contractor may require due to such a substitution must be clearly identified by the contractor in their submittal. Also, the HVAC plans herein are copies of as-built plans from previous projects. If information on the HVAC plans conflicts with other information provided herein, the HVAC plans shall be considered partially superseded by the information otherwise provided herein. Contractors shall comply with the attached Control System Specification for installation of equipment.

b. Existing HVAC equipment (dampers, valves, motors, etc.) is the responsibility of Fairchild AFB. Commissioning of all hardware points is included in the scope of this project, meaning that the proper signal must be sent to the HVAC equipment being controlled, over the entire operating range. It is preferred that actual operation of the controlled device be used as the observation of successful commissioning, but not mandatory. Non-operating or poorly operating existing controlled HVAC devices should be reported to the EMCS office. Phone number is (509) 247-2817.

c. Software provided shall operate on Windows XP Service Pack 2, and possibly Windows Vista in the future. Software provided shall include upgrades to most recent version available at the end of the warrantee period at no additional charge.

d. Commissioning shall be conducted by an independent contractor, as discussed elsewhere in this document. Commissioning shall be coordinated with the EMCS office.

e. The contractor may propose improved sequences of operation. However, Fairchild AFB has final approval authority.

f. Invensys/Robertshaw controllers removed from service for replacement shall be returned to Fairchild AFB EMCS office.

g. Training shall include 16 hours of on-site training for a minimum of 6 people, and shall also include 1 week of factory training on the system for 4 people.

h. Software licensing shall allow an unlimited number of points and an unlimited number of users at no additional cost. Software licensing shall grant Fairchild AFB the right to modify any existing programming or add new programming developed by Fairchild AFB at no additional cost.

i. An unlimited number of users shall have access to graphics using Internet Explorer via the Fairchild AFB intranet.

j. Programming shall display a separate page for each of the following:
- all meters in a building on one metering page for that building
- trends shall be set up for each meter in this contract
- one page for all boilers in a building. Pumps and converters may be shown on the same page if convenient
- one page for each air handling unit in a building
- VAVs may be shown more than one per page, as long as all VAVs displayed on a page are served by the same air handling unit.
- Alarms shall be shown on a separate alarms page, in addition to being shown on the individual device page.

k. Computer security: Certification to Operate (CTO) on Fairchild AFB's computer network is required.

l. The upgraded system shall have the ability to track programming changes, record what was changed, when it was changed, and what it was changed from.

m. The system shall have the ability to upload and download data from a remote location on the system (a wall mounted temperature sensor to a VAV box, for instance).

n. The system shall have the ability to substitute another computer or a laptop for a server in the event of a failure.

o. Backup copies of all installed software shall be provided on CD.

p. As-built controls drawings shall be submitted showing controller wiring.

4. COMMISSIONING: Commissioning shall be performed by an independent agent specializing in commissioning.

a. The Contractor shall make the observations, adjustments, calibrations, measurements, tests of the control systems, set the time schedule, and make any necessary control system corrections to ensure that the systems function as described in the sequence of operations.

b. Each device will be tested to insure it operates properly from sensors, through the wiring, through the controllers, to the front end:
1. Verify all start/stop outputs control the correct devices
2. Verify all status inputs give correct on or off reading
3. Verify all analog devices operate correctly through the full range of the device.

c. All temperature sensing devices will be calibrated to read correctly by comparing the actual value of the variable to the DDC panel reading.
1. Insertion and Immersion sensors at one physical location of the sensing element and compared to the DDC panel reading
2. Averaging sensors shall be checked every 2 feet along the sensing element and compared to the DDC panel reading. These readings shall be averaged.

d. Verify program functions operate correctly.
1. Outside air lockouts will be verified by changing the set points and insuring the devices start or stop according to the programming.
2. Trends will be setup for all set points and temperatures to verify that set points are being attained. The trends will cover a minimum of 30 days. Commissioning shall not be considered complete until at least 7 consecutive days of correct readings are obtained for each point.
3. Trends will be setup for Opstart and Morning Warm-up program functions to verify these programs operate correctly. The trends will cover a minimum of 30 days.

e. Verify graphical user interface (GUI) points operate correctly.
1. Verify all graphic points are displaying the correct point.
2. Verify all user overrides apply to the correct points.
3. Verify all page links operate correctly.
4. Verify all trend links apply to the correct points.

The contractor shall submit written records of each device check, including reference value(s), device readout(s), signature, and date.